Exploring Meteorite Mysteries

Glossary

Words that appear *in italic* type within a definition also are defined in the Glossary.

Absorbent: able to suck up liquid like a sponge.

Accrete (accretion): accumulate under the influence of *gravity* and some minor forces.

Achondrite: *stony meteorite* without *chondrules.*

Amino Acids: organic acids that are the components of proteins.

Angular: a shape description that indicates an object has one or more angled edges rather than rounded edges.

Anorthosite: an *igneous* rock made up almost entirely of plagioclase feldspar.

Aphelion: the point of a celestial body's *orbit* most distant from the Sun.

Asteroid: one of thousands of small (*diameters* under 1000 km) solid planetary bodies *orbiting* the sun; most *orbit* the Sun between Mars and Jupiter, but a few come closer as they cross the *orbits* of Earth or Mars.

Asteroid belt: area between Mars and Jupiter where thousands of *asteroids orbit* the Sun.

Astronomer: one who studies the science of celestial bodies and their origins, magnitudes, motions, and compositions.

Atmosphere: mixture of gases that surround a planet.

Attrition: the amount of material worn away during sample preparation; small losses.

Bachelor's degree: usually the lowest academic degree given by a college or university.

Basalt: fine-grained, dark-colored *igneous* rock composed primarily of plagioclase feldspar and pyroxene*;* other *minerals* such as olivine and opaques are usually present.

Basaltic achondrite: a type of *meteorite* consisting of the *minerals* feldspar and pyroxene; they are similar to *basalts* from lava flows on Earth.

Bleb: a small, usually rounded *inclusion* of one material in another.

Breccia: rock consisting of *angular*, coarse fragments embedded in a fine-grained *matrix.*

Carbonaceous chondrite: a primitive type of *meteorite* usually with *chondrules;* they contain water and *carbon compounds*, including *organic molecules.*

Carbon compounds: forms of carbon combined with other elements, includes *organic molecules* such as *amino acids.*

Catastrophe: a great disaster or misfortune.

Chromatography: separation of complex solutions into chemically distinct layers, usually different colors, by seepage through an *absorbent* material.

Chondrite: stony *meteorite* containing *chondrules* embedded in a fine grained *matrix* of pyroxene, olivine, and metallic nickel-iron.

Chondrule: a small rounded body of various materials, chiefly olivine or pyroxene, found embedded in a usually fragmental *matrix* in certain of the stony *meteorites.*

Classification: the formal system of arranging objects or information into like groups.

Clast: a broken piece of rock formed by the breakup of a larger object.

Clay: a size term denoting particles, regardless of *mineral* composition, with diameters less than 1/256 mm.

Comet: a small body of ice and dust circling the sun in an *elliptical orbit*; when it comes near the Sun gases are released to form a tail that points away from the Sun.

Composition: the amounts of all the elements in a rock or *mineral.*

Condensation: to form a liquid or solid from the gaseous state.

Core: the central region of a planet or moon, frequently made of different materials than the surrounding regions *(mantle* and *crust);* Earth and the Moon are thought to have cores of metallic iron and nickel.

Cosmic spherules: melted droplets of *meteorites*, less than 1mm in size, found in ocean sediments and ice.

Crater : a hole or depression (see *impact*); most are roughly circular or oval in outline; on Earth most natural craters visible at this point in geologic time are of volcanic origin; on the Moon most craters are of *impact* origin.

Cretaceous: the period of geologic time from approximately 140 million years ago to about 65 million years ago; abbreviated symbol is K.

Cross section: a profile portraying an interpretation of a vertical section of the Earth explored by geophysical and/or geological methods.

Crust: the outermost layer of a planet or moon, above the *mantle.*

Crystallization: to form crystals.

Cumulate: collection of *minerals* that have been separated from molten rock by *density* settling.

Curation: taking care of collections of samples and distributing information on those samples.

Curator: one in charge of a collection or exhibit of items such as in a museum.

Deposition: the process of accumulation of a *sedimentary* layer of rock or precipitate.

Diameter: the length of a line that goes from edge to edge of a circle or other shape and also passes through the center of that shape.

DNA: deoxyribonucleic acid; functions as the transfer of genetic information from cells in living organisms.

Dense: means the mass of an object is relatively high per unit volume of the object; object could be described as "heavy for its size".

Density: *mass* per unit *volume*; how much material is in a given space.

Differentiation: chemical zonation caused by differences in the *densities* of *minerals*; *dense* materials sink, less *dense* materials float.

Diffracted: when light beams are deflected or bent by interaction with an object (diffraction).

Doctor of Philosophy: usually the highest academic degree given by a university or college in any field of academic study (Ph.D. or doctorate).

Ecliptic plane: the plane defined by the *orbit* of the Earth around the Sun; most planets *orbit* in or near the ecliptic plane.

Ejecta: material thrown out from and deposited around an *impact crater.*

Electromagnetic spectrum: energy ranges from gamma-rays through x-rays, *ultraviolet*, visible light, *infrared*, microwave, all radio waves (all having specific energy).

Ellipse: (elliptical) a closed curve of oval shape.

Emit: to give off, such as light or sound.

Erosion: process of physically changing and or moving rocky material; on Earth this especially includes *weathering* and transport of material by water and wind.

Expedition: a journey for a particular purpose such as research or discovery.

Fall: is a designation for a *meteorite* that was observed as it came through Earth's atmosphere and was retrieved soon afterward.

Find: is a *meteorite* that was not observed to *fall*; it may have been on Earth for a long time.

Fireball: the streak of light and loud noise of a large *meteor* going through the Earth's *atmosphere.*

Friable: easily crumbled rock fragments.

Fusion crust: dark glassy coating on the surface of a *meteorite*, caused by heating as the *meteorite* enters the *atmosphere.*

Geochemist: a scientist who studies the chemical composition of, and chemical changes in the Earth or other planetary bodies.

Geologist: scientist who studies Earth, its materials, the physical and chemical changes that occur on the surface and in the interior, and the history of the planet and its life forms; planetary geologists extend their studies to the Moon, planets, and other solid bodies in the *solar system.*

Geophysics: extensive experimental and modeling studies of the Earth and other planetary bodies with respect to their structure and development.

Gravity: a force of attraction pulling any two things toward each other, dependent on the *mass* of the objects.

Heterogeneous: composed of several different types of material.

Highlands: oldest exposed areas on the surface of the Moon; extensively *cratered*, and chemically distinct from the *Mare.*

Homogeneous: composed of one type of material.

Hypothesis: an idea or group of ideas that attempt to explain an observed or predicted event or occurrence.

Igneous: rocks or processes involving the formation and solidification of hot, molten *magma* on the surface of a planetary body or below the surface.

Impact: the forceful striking of one body, such as a *meteorite,* against another body such as a moon or planet (c*rater).*

Impact crater: hole or depression formed by a *meteorite* colliding with a surface.

Impactor: object that strikes (*impact*) a surface, may create a *crater* (p*rojectile, meteorite).*

Incandescent light: light which came from an electrically heated filament.

Incident light: light that has struck an object (see also reflected light).

Inclusions: a fragment of another rock enclosed in a rock.

Infrared: the portion of the electromagnetic spectrum with wavelengths of from 0.7 to about 1.0 micrometers, just beyond the red end of the visible spectrum.

Inorganic: compounds that are not formed by living organisms.

Interplanetary dust particles: microscopic bits of *asteroids* or *comets*; these particles can be collected from high in the *atmosphere.*

Iridium: a hard, brittle, very heavy, metallic chemical element used in alloys; found in greater percentages in *meteorites* as compared to Earth rocks.

Iron meteorite: *meteorite* consisting of metallic iron and nickel.

Isotope: elements having an identical number of protons in their nuclei but differing in their number of neutrons.

Kinetic energy: the energy of a body or *mass* in motion; with greater speed and *mass* the kinetic energy increases.

Latitude: the angular distance North or South from the Earth's equator measured in degrees; Equator being 0° and the poles 90°N and 90°S.

Lava: fluid *magma* that flows onto the surface of a planet or moon; erupted from a *volcano or* fissure;

the rock formed by solidification of magma.

Layer: a bed of stratum or rock.

Longitude: the angular distance East or West, between the meridian of a particular place on Earth and that of Greenwich, England, expressed in degrees or time.

Lunar meteorites: *meteorites* that have been identified through their chemistry and *minerals* as being from the Moon.

Magma: term applied to molten rock in the interior of a planet or moon; when it reaches the surface, magma is called *lava.*

Magnetism: a property possessed by certain bodies, whereby under certain circumstances, they repel or attract one another according to determined laws.

Magnetic field: a force that acts over a region of space around a magnetically charged body.

Mantle: a mostly solid layer of Earth lying beneath the *crust* and above the *core*; consisting mostly of iron and *silicate minerals.*

Maria: dark areas on the Moon covered by *basalt lava* flows (singular Mare).

Martian meteorites: *meteorites* that have been identified as pieces of Mars by a combination of their relatively young age and their chemical similarity to Viking data from Mars.

Mass: the amount of matter in a given object.

Master's Degree: academic degree higher than a *bachelor's degree* but lower than a *doctoral* degree.

Matrix: the smaller sized grains in a rock, where the rock consists of large grains or fragments surrounded by smaller grains.

Metal: any of a class of substances that typically are opaque, are good conductors of electricity, and often have a shiny luster like gold.

Metamorphic (metamorphosed)**:** rocks that have recrystallized in a solid state as a result of changes in temperature, pressure, and chemical environment.

Meteor: relatively small body of matter traveling through interplanetary space.

Meteorite: a metallic or stony (*silicate*) body that has fallen on Earth, Moon or other planetary body from outer space (see *Impactor, Projectile).*

Meteor shower: group of *meteors or* comet dust, traveling together, which enter the a*tmosphere* within a few hours.

Meteorite shower: a large number of similar *meteorites* falling together; caused by the breakup of a large *meteorite* in the atmosphere.

Meteoriticist: someone who studies *meteorites.*

Micrometeorites: *meteorites* smaller than 1 mm.

Mineral: naturally occurring *inorganic* solid with a definite chemical composition and crystal structure.

Mineralogy: the mix of *minerals* which make up a rock.

Orbit: the path of an object in space moving about another under gravitational attraction.

Ordinary chondrites: the most common class of *meteorites,* consisting of variable amounts of metal and chondrules in a matrix of mostly *silicate minerals.*

Organic molecules: compounds of carbon, hydrogen and oxygen, that form complex molecules (may or may not be from living organisms).

Perihelion: the point of a celestial body's *orbit* closest the Sun.

Planetary geology: the study of the planets in our *solar system* concerning the history and formation of the interior and surface.

Planetary meteorites: a class of *igneous* or *brecciated meteorites* from other planets; currently, *meteorites* have been found that come from the Moon and Mars.

Platy: the *texture* of a rock that is composed of flat *minerals* or rock fragments.

Porous: contains open or void spaces between solid

material.

Post doc: researcher who has completed a *Doctor of Philosophy* degree and has a temporary position such as a fellowship to pursue a specific type of research.

Projectile: object that *impacts* a surface.

Quartz: a common, often transparent crystalline *mineral* that is a form of a silica.

Research: studious and critical inquiry aimed at the discovery and interpretation of new knowledge.

Reflectance: the amount of light of a particular color reflected by a surface, divided by the amount of light of the same color that strikes the surface.

Reflectance spectroscopy: the study of the colors of light reflected from a surface.

Reflected light: light which strikes a surface and bounces back, as happens with a mirror.

Regmaglypt: any of various small indentations or pits on the surface of *meteorites.*

Regolith: loose, *unconsolidated* rock, *mineral,* and glass fragments; on the Moon and some other planetary bodies, this debris is produced by *impacts* and blankets the surface.

Retrograde: an *orbit* that moves in the opposite direction of Earth's *orbit.*

Rim: the border of a land form, such as the curved edge surrounding the top part of a *crater.*

Scale model: an object that gives the size of the sample in proportion to the size of the actual thing.

Sediment: solid rock or *mineral* fragments transported and deposited by wind, water, gravity, or ice; precipitated by chemical reactions; or secreted by organisms; accumulated as layers in loose, *unconsolidated* form.

Sedimentary: *rock* formed when *sediment* is compacted and solidified.

Shock: a sharp *impact* or violent shake; evidence of large shocks may be seen in the rocks and *minerals* near an *impact crater.*

Silicate: *minerals* that contain the elements Si and O, plus one or more metals: Mg, Fe, Ca, Na, Al.

Solar nebula: gravitational accumulation of solid particles and dust around the Sun.

Solar power: energy derived from the Sun or sunlight for use as a source of *electricity.*

Solar system: the Sun and all the objects such as the planets, moons, *asteroid*s, and *comets* that *orbit* the Sun.

Solar wind: the stream of charged particles, mainly ionized hydrogen, moving outward from the Sun with velocities in the range of 300-500 kilometers per second.

Soot: a black substance that is formed when something burns.

Specimen: a sample, as a rock, fossil, or ore.

Spectroscopy: the excitation of the spectrum, its visual or photographic observation, and the precise determination of wavelengths.

Sphere: an object that is round or almost round in all dimensions like a ball.

Static electricity: stationary charges of electricity.

Stony-iron: a class of *meteorites* composed mostly of an intimate mixture of *silicates* and iron metal.

Stony meteorite: a class of *meteorites* composed mostly of silicate *minerals*.

Strewn field: a generally *elliptical* pattern of distribution of recovered *meteorites,* formed when a *meteor* is fragmented as it passes through the *atmosphere*.

Superstition: beliefs or practices resulting in fear of the unknown, ignorance and trust in magic or chance.

Technician: a person who has acquired the technique of a specialized skill or subject.

Tektites: small fragments of melted and aerodynamically shaped rock that were ejected from a large *impact crater.*

Tectonic: pertaining to rock forms due to deformation in the *crust* of Earth and other planetary bodies.

Terrain: area of the surface with a distinctive physical or geological character.

Tertiary: the period of geologic time between 65 and 2 million years ago, abbreviation is T.

Texture: general physical appearance of a rock.

Triangulation: method of finding the distance to an object or location of an event in the sky by creating a triangle, with two vertices the ground, and the object at the third vertex.

Ultraviolet: having a wavelength shorter than visible light and longer than x-rays.

Unconsolidated: materials loosely pack but not cemented to each other.

Unfractured: does not contain breaks or cracks.

Uniform: having always the same form, manner, or degree.

Vaporize: to change something from a liquid or a solid to a gaseous state as in rock that is completely altered to gas during large *impacts.*

Velocity: rate of motion in a specific direction.

Vesicle: bubble-shaped cavity in a volcanic rock formed by expanding gases.

Volatiles: chemical elements that enter a gas phase at relatively low temperatures.

Volcanism: the physical processes of a *volcano*.

Volcano: mountain formed from the eruption of *igneous* matter through a vent; volcanism refers to all natural processes resulting in volcanoes and other *igneous* surface events.

Voltage: electromotive force measured in volts.

Volume: space occupied, as measured by cubic units.

Weathering: the mechanical breakdown and chemical alteration of rocks and *minerals.*

Wick: (verb) to draw a liquid on to or up a solid (i.e. a towel).

Zoologist: scientist who studies animals.